(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 643 917 A2**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **94119124.9**

(51) Int. Cl.6: **A22B 1/00**

(22) Date of filing: **07.02.91**

This application was filed on 05 - 12 - 1994 as a divisional application to the application mentioned under INID code 60.

(30) Priority: **08.02.90 DK 334/90**

(43) Date of publication of application:
22.03.95 Bulletin 95/12

(60) Publication number of the earlier application in accordance with Art.76 EPC: **0 441 633**

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IT LI NL SE

(71) Applicant: **Slagteriernes Forskningsinstitut**
Maglegaardsvej 2
DK-4000 Roskilde (DK)

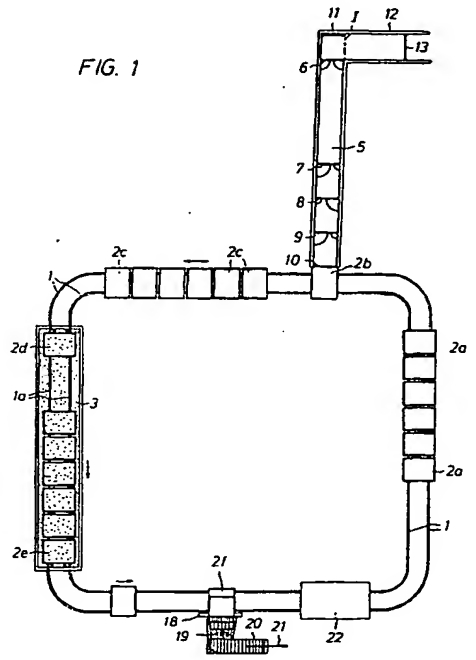
(72) Inventor: **Christensen, Leif Lykke**
Irisvej 18
DK-3500 Vaerloese (DK)
Inventor: **Joergensen, Tage Wichmann**
Roede Mellemvej 94, E 158
DK-2300 Copenhagen S (DK)
Inventor: **Hansen, Claes-Henrik**
Karlavagen 12
S-22 40 Lund (DK)

(74) Representative: **Bayliss, Geoffrey Cyril et al**
BOULT, WADE & TENNANT
27 Furnival Street
London EC4A 1PQ (GB)

(54) Apparatus for separating a flock of animals into groups.

(57) Apparatus is provided for separating a flock of animals into groups, prior to being slaughtered in a slaughterhouse. The apparatus comprises an oblong corridor (5) which is wide enough to allow the animals to turn around in the corridor, and at least one transverse wall (7; 8; 9) protrudes from one side wall of the corridor so far into the corridor that two animals cannot pass through the gap between the transverse wall and the other side wall of the corridor at the same time, whereas one animal has free access through the gap.

FIG. 1



EP 0 643 917 A2

The present invention relates to apparatus for separating a flock of animals into groups.

Usually, animals to be slaughtered are delivered to a slaughterhouse in the form of fairly large flocks of animals. In a known system a flock is separated into smaller groups, each group being treated separately.

For example, in GB-A-2211389, pigs to be slaughtered are divided into groups in pens in which they are kept, until they are driven out and into a stunning apparatus. A system of separating walls in the pens serves to divide a flock of animals into smaller groups. The separating walls are also used when the animals are being driven out of the slaughterhouse pens for stunning. The separation process of the system is not very fast and may stress animals when they are not willing to enter of their own accord.

An object of the invention is to provide apparatus for achieving a high capacity separating system acceptable to the animals giving an undisturbed separation of a flock of animals into groups without stressing the animals.

According to the invention there is provided an apparatus for separating a flock of animals into groups, characterized in that the apparatus comprises an oblong corridor which is wide enough to allow the animals to turn around inside the corridor, and in that at least one transverse wall protrudes from one side wall of the corridor so far into the corridor that two animals cannot pass through the gap between the transverse wall and the other side wall of the corridor at the same time, whereas one animal has free access through the gap.

The apparatus may be applied at the unloading area of a slaughterhouse to separate a delivered flock of animals into smaller groups before they are stalled or handled further, but it may especially be applied in connection with the separation of a flock of animals from the pen area of the slaughterhouse into smaller groups, which are to be driven into and stunned in boxes which have room for one group of animals in each box.

The apparatus of the invention has proved to be able to provide the separation in a very short time, so that a supply of more than 720 animals per hour may be achieved by means of fairly simple equipment. Furthermore, the apparatus may be automated, so that it becomes independent of operators. This contributes to an increased capacity of separation, since the animals are willing to enter the corridor of their own accord, when there are no human beings in the area.

Means are preferably provided to close the gap between the transverse wall and the other side of the corridor. It may e.g. be an arrangement to slide the transverse wall over to the other side of the corridor, or a separate sliding gate or swing gate. In this way the separation may be retained.

Preferably transverse walls protrude alternately from one or from the other side wall of the corridor. This contributes to reducing the speed of the animals, which gives a more uniform distribution of the animals in the corridor.

The floor area between two transverse walls in the corridor may be large enough to hold a group of 3-15 animals, preferably 4-8 animals. This corresponds to the preferred size of the groups which may be stunned in boxes.

The transverse walls are preferably designed with or as sliding walls, so that no extra space is required in the corridor for the operation.

In an automated embodiment of the invention, the sliding wall may be moved, by means of a horizontal, pneumatic cylinder, between an open position, which allows passage of an animal, and a closed position, which prevents passage. The pressure of the cylinder may be adjusted, so that there is no danger of squeezing an animal.

In order to prevent animals from being trapped in the gap, the vertical edge of the transverse wall next to the gap may be provided with a free-rolling, vertical roller.

The animals are willing to enter the corridor of the system when it is light and airy. This may be achieved if the transverse wall is of a grille construction and preferably consists of vertical bars which have been fastened in a frame.

The separation of a flock of animals and the filling of boxes may be performed at the same place if the corridor is made up of several boxes placed end to end, the end walls of which boxes may be slid away so that the animals may enter the corridor which is formed when the end walls are slid away, and the animals are confined when the end walls are slid back into position.

In order to ensure the transfer of the groups from the corridor to other areas, e.g. anaesthetization boxes, the corridor may be provided with driving devices. Parallel with one side wall of the corridor, and along the wall, there may be a plate which can be moved over to the opposite side wall of the corridor.

In order to achieve a uniform number of animals in each group, the apparatus may comprise a unit which is designed to register the number of animals in at least one of the areas formed between two transverse walls, preferably by means of a vision system. The vision system may register the animals either by identification of their contour or by calculating the area of the animals. The unit may actuate an automatic device for the closing of a transverse wall, when there is a predetermined number of animals in an area.

The apparatus according to the invention is mainly used for the separation, prior to stunning, of

pigs, including sows.

By way of example, the invention is described in detail in the following, with reference to the drawings, in which:-

Figure 1 shows a plant for automatic separation and stunning of animals to be slaughtered, as seen from above;

Figure 2 a second embodiment of a plant for separation and stunning;

Figure 3 a third embodiment of a plant; and

Figure 4 a fourth embodiment of a plant.

The plant in Figure 1 includes an endless transport path 1 for boxes 2 which are designed to hold 4-6 animals at a time. The path is divided into several sections which may be operated independently of each other according to the transport pattern described below. Each section of the path is built up of two endless belts which are parallel to each other and motor driven.

More details of the design of the plant appear from the following explanation of how it works:

An empty transport box 2a is run from an area of accumulation for empty boxes into position for receipt of animals, being automatically placed opposite one end of a corridor 5 (Figure 1, box 2b). In the corridor there are four automatic swing-gate systems 6,7,8,9 and an elevating gate 10. Besides, there is a so-called travelling/elevating gate 11, which may move in the whole length of the corridor, and in the closed position it may pass by the swing-gate systems 6,7,8,9 when these are open.

At first, the swing-gate system 6 and the elevating gate 10 are open, while only the short one of the swing gates in the systems 7,8,9 is open.

Each of the swing gates in the systems 7,8,9 may conveniently be of a grille construction, preferably having vertical bars fastened in a frame.

A group of animals which have been stalled so that they are separated from other animals are automatically led out from the pens of the slaughterhouse. The group may e.g. comprise 15 animals. GB-A-2 211 389 describes pen facilities for group treatment of animals being received at the slaughterhouse.

Via the various driving corridors the animals finally arrive in a driving corridor 12, through which they are driven towards and into the corridor 5 by means of a travelling/elevating gate 13. The gate stops when it arrives at the position indicated by the dotted line I. Simultaneously, the gate 11 in its closed position starts moving forward in the corridor 5, so that the animals are driven forward.

The animals will also of their own accord search forward in the corridor 5 and one by one pass through the gaps which are formed by the gate systems 7,8,9, because the short swing gate is open. Each gap is provided with a detector which registers the number of animals passing.

When five animals have passed through the gate system 9, the short gate will be closed and the elevating gate 10 will then be raised, so that the animals may go into the box 2b, one side of which is open. The gate system 8 is closed when ten animals have passed through. The travelling/elevating gate 11 stops when it arrives at the gate system 7, which means that there are now five animals in the corridor section between the gate systems 7 and 8, like in the two sections before that. The short gate in the gate system 7 is closed, and the travelling/elevating gate 11 is moved forward to a position immediately in front of the gate system 9, where the gate is lowered again. The travelling/elevating gate 11 is then run forward to a position immediately behind the elevating gate 10, whereby the five separated animals are driven all the way into the box 2b.

The box is closed and transported down the transport path 1 to a section of the path which serves as an accumulation area for filled boxes 2c. An empty box 2a is then led from the area for empty boxes to the end of the corridor 5. During this procedure of change the gate 10 is closed and the gate system 9 is opened, so that the animals from the section between the gate systems 8 and 9 may be distributed over a larger area. The travelling/elevating gate 11 is run to a position immediately in front of the gate system 8, where the gate is lowered again.

The gate 10 is raised so that the animals may enter the box 2b, which has been placed at the end of the corridor 5, and at the same time the travelling/elevating gate 11 is moved slowly forward in the corridor. The gate system 8 is opened as soon as there is room enough. The gate 11 stops in a position immediately in front of the gate 10. The five animals have now been driven into the box 2b, which is closed and, by means of the transport path 1, transported to the area of accumulation for filled boxes 2c at the end of the line of filled boxes. The gate 10 is lowered and the gate 11, in open position, is run back to a position immediately in front of the gate system 7.

From the area for empty boxes a new box 2a is led by the transport path 1 to the end of the corridor 5, and the gate 10 is raised, so that the animals may enter the box. The gate 11 is lowered and moved forward in the corridor, driving the last five animals into the box 2b. The gate 11 stops in a position in front of the gate 10. The box is transported to the accumulation area for filled boxes 2c, the gate 10 is closed, and a new empty box 2b is placed at the end of corridor 5.

A new group of animals is guided into the corridor behind the gate system 7 by means of the travelling/elevating gate 13. The separation of the animals into the three sections which are limited by

the gate systems 7,8,9 and 10 may be started as soon as the travelling/elevating gate 11 is moved forward from its position in front of the gate system 7 when driving the last group towards a box, the short gate in the gate system 7 being opened, so that the animals may enter the sections. When the gate 11 has passed the system 8, the long gate in this gate system is closed, and a similar thing takes place in system 9 when the gate 11 has passed this system. Therefore, the animals will have plenty of time to split up.

The travelling/elevating gate 11 is raised and moved from the position at the gate 10 back to the back position shown in Figure 1, where it is closed.

Then, the process described above is repeated, with separation into three groups, each group being driven into its own box, and transportation of the boxes to an accumulation area on the transport path 1. All this takes place automatically at a quiet i.e. relaxed pace, which has been adapted to the natural pattern of behaviour of the animals. The animals are willing to be driven into an empty box, since it is open and light. Several animals may accompany each other into the box at the same time, and the stress level of the animals is low because of the preceding, quiet treatment.

The box 2b, which is on the opposite side of the corridor 5, may be designed in such a way that it is not conspicuous from the corridor. The side can e.g. be made of vertical bars which allow light and air to enter the box.

When there is room for a box in a stunning pit 3, and when at the same time and under the prevailing circumstances a need on the slaughtering line for the animals which are to be anaesthetized may be foreseen, an automatic system takes care that a box 2c is taken from the accumulation area and via the transport path 1 is transported to the entrance area of the stunning pit. The box is then lowered to its bottom positionm which brings the box 2d down into the atmosphere of carbon dioxide, which quickly enters the box through large holes in the box or between the bars, so that the stunning of the animals in the box may start immediately. The box is placed on transport path section 1a at the bottom of the pit.

When the stunning period for the animals in the box is over, the box 2e has arrived at the other end of the pit and is lifted up to floor level, and a catch brings the box over to the transport path at the end of the pit.

During the operation, the anaesthetization pit is supplied with carbon dioxide so that the concentration of carbon dioxide in the atmosphere of the pit is kept at the desired level, e.g. 88-98%.

From the pit the box with the stunned animals is carried further on to a discharge device. By the veterinary regulations in force today this should happen immediately, so that there is no risk that the animals will wake up before the sticking takes place in the blood collection area. If the veterinary authorities allow so-called lethal stunning, the sticking may be delayed somewhat, since the animals cannot reawake, and a certain accumulation of boxes with stunned animals may possibly be acceptable on the transport way between the pit and the discharge device.

In the discharge device one of the belts of the path 1 is raised somewhat in relation to the other, so that the box 2f is allowed to take up an inclined position. A rail 18 prevents the box from sliding down the belts. The device is provided with a mechanism which opens one side of the box, so that the stunned animals may slide out of the box and down on to a chute 19. From the chute the animals slide over to a conveyor belt 20. An operator suspends the animals one by one in their hind legs by means of a usual chaining system. The animals are transported to sticking and debleeding by means of a conveyor 21, after which the carcasses go through the various kinds of treatment on the slaughter line at the slaughterhouse.

The emptied box is transported further down the path 1 and through a cabin 22, in which it is washed and cleaned. The box is then transported to the area of the path for empty boxes. From here the boxes may be transported back to the area for entering of animals, which entering takes place as explained above. This concludes the cycle of the boxes.

The separation of a number of animals into a small group of 4-6 animals and the use of the boxes to transport the groups up to and through the stunning pit bring great advantages in the form of a more animal-friendly treatment, reduced stress level, increased automation and flexibility of the plant, and uniformly performed stunning, which advantages will make themselves known at the slaughterhouses in a rational operation of the plant and an improved meat quality of the slaughtered animals.

The plant according to Figure 2 is a more compact embodiment, as a number of animals are separated into small groups by means of three transport boxes which are placed end to end. Furthermore, the accumulation area for filled boxes is smaller, as there is only room for three boxes between the filling area and the stunning area. The design of the plant appears from the following explanation of how it works.

From the pen area of the slaughterhouse a flock of animals are driven through a driving corridor 12 by means of a travelling/elevating gate 13, so that they are led to a corridor 5. When the gate 13 comes to position I, it will stop automatically.

At the end of the corridor 5 there are three boxes 2g,2h,2i, the two end walls of which may be moved vertically or horizontally. The boxes are placed with a small space between, allowing three sliding panels 30 to move into the corridor area formed by the boxes. In an alternative embodiment the boxes may be positioned tightly, allowing one or two side walls of the box to serve as a corresponding sliding panel. Sliding may e.g. take place by means of a pneumatic or a hydraulic cylinder.

In the initial position, each of the sliding panels has been slid about 2/3 into the corridor area. When the filling operation starts, two intermediate gates 31 are swung to the side wall of the corridor, and the end walls of the boxes are opened, except the end wall farthest away from the corridor 5. The boxes are placed on a weighing-cell system, which is connected with a control unit which may actuate the cylinders for sliding on the side walls.

The animals move forward of their own accord in the corridor 5 and into the corridor area formed by the three boxes through the narrowings at the sliding gates 30.

The weighing cells will register whether the predetermined number of animals are present in e.g. the box 2i. When this is the case, the box in question will be obstructed by sliding the sliding panel 30 fully into the corridor area by means of e.g. a pneumatic cylinder. A corresponding cylinder will then slide a box end wall into position on each side of the closed sliding panel. In the same way, the boxes 2h and 2g are closed by means of the two other sliding panels 30, when the weighing cells under these boxes register the predetermined number of animals in the boxes, and the end walls of the boxes are slid into position by means of cylinders. The sliding gate 30 between the box 2g and the box 2h is closed when the total number of animals registered in the boxes 2h and 2i is ten, no matter whether the box 2i is closed or not.

During the procedure a travelling/elevating gate 11 will move to the right from its extreme left position to position II, by which operation the animals will be led forward in the corridor 5. When the gate 11 is in position II, the sliding panel 30 at the left side of the box 2g will be pulled fully back, if a signal has not been given before that the boxes 2h and 2i have been filled up. The gate 11 proceeds to the right and stops when it arrives at its extreme right position at the end of corridor 5 at the box 2g, after which the box 2g will be closed.

After the boxes have been closed, the three sliding panels 30 will be pulled back completely from the boxes, which may now be transported forward on a conveyor 1. The three boxes are moved fully three box lengths away from the corridor 5, so that the front box comes into a position where it is ready to be admitted into a stunning pit 3. The box is lowered down into the pit by means of a device when there is a need for stunned animals on the slaughter line. The box is conveyed through the pit by means of a conveyor and it is lifted up to floor level again by means of a second device.

The two subsequent boxes in the waiting area are led down into the pit in the same way, when the need arises.

As soon as the three boxes 2g,2h,2i have been removed from the position at the end of the corridor 5, three empty boxes 2j,2k,2l are conveyed from the path 1 to that position.

The end walls of the boxes are slid away by the cylinders and the sliding panels 30 are slid again 2/3 into the corridor area formed. The gate 11 is raised and run back to its initial position, so that a new flock of animals may go from the driving corridor 12 via the corridor 5 and into the corridor area formed by the three boxes. The gate 11 is closed, and the procedure of driving forward a flock of animals and separation into three groups, one group in each box, may then be repeated. If there are no available boxes in position 2g,2h,2i, the animals would be kept back by the intermediate gates 31 which remain closed until the empty boxes are in position.

Shortly after a box has been lifted up from the pit 3, the stunned animals will be discharged from the box. The box 2m is turned around by means of a mechanism, so that the animals will slide out on to a chute 19 and then down on to a conveyor belt 20. An operator may then chain the animals in the usual way. They are transported farther on to the sticking area of the slaughter line by means of a conveyor 21.

The empty box is returned back to its starting position and it is transported to a waiting area on the path 1, which is located at the boxes which are indicated by 2j,2k,2l. When three empty boxes have been accumulated here, they may be transferred simultaneously to the filling area at the end of the corridor 5, for separation of new animals into groups and filling of the boxes. The procedure may then be repeated.

The plant in Figure 3 has a resemblance to the compact embodiment in Figure 2, but the separation of animals is here made in a corridor 40, designed for that purpose, which is end to end with a corridor 5 and closed by an end wall. The side walls of the corridor are solid and e.g. painted green or in a colour which looks similar to the animals, whereas the end wall consists of a frame with vertical bars placed at intervals of about 8 cm. The floor of the corridor is preferably made of concrete, with a downward gradient to a drain outside the corridor. The floor is provided with a non-

skid flooring which is green. It may also be provided with transverse slits, through which dung and urine from the animals may escape.

The corridor 40 may be divided into four sections 40a-40d by means of two sliding panels 43, 44, an elevating or sliding gate 42 as well as intermediate gates 48. Each sliding panel consists of a frame construction provided with vertical bars, which may automatically be moved between an open position, allowing one animal at a time to pass the construction, and a closed position, which will obstruct the corridor 40. In their open position the sliding panels will protrude about 2/3 into the corridor, so that the opening allowed for the animals will be 40-65 cm. In the closed position the opening is reduced to about 10 cm. The vertical edge of the sliding gate has a free-rolling, vertical roller, which reduces the risk of squeezing an animal when the panel is being closed.

Along one of the walls of the corridor, in each of the corridor sections 40a,40b,40c, there is placed a plate 45 which may be moved by means of a driving arrangement past the opposite side wall of the corridor. In the sections 40a,40b,40c the latter wall consists of three elevating gates 46, placed end to end, which may be raised or lowered automatically.

The boxes 2 used in this plant have a similar side wall 47, which may be raised or lowered automatically by means of a lifting device located opposite each of the sections.

More details of the design of the plant appear from the following explanation of how it works:

From the pen area of a slaughterhouse a flock of e.g. 15 animals are driven forward in a driving corridor 12 by means of a travelling/elevating gate 13. The gate stops in position I. Another travelling/elevating gate 11 leads the animals forward in the driving corridor 5 towards the corridor sections 40a-40c, in which the gates 42,43,44 protrude about 2/3 into the corridor. The intermediate gates 48 are opened, too. The animals go forward of their own accord in the corridor. Over the corridor sections there is a video camera with a computer unit which registers the number of animals in section 40a,40b. The computer unit sends an impulse to a control unit which actuates a cylinder unit, which is connected with the sliding panel, when there are five animals or ten animals in the section 40a or in both of the sections 40a and 40b, respectively. Normally, the left-hand sliding panel will close first, and then the right, but the control unit will also allow a reverse closing order.

The closing and the opening of the gates, including the intermediate gates 48, take place in a way similar to that of the embodiment according to Figure 2. When the gate 11 has arrived at the gate 42, this will be closed. The animals have now been separated into three groups, each group in its own section 40a,40b,40c.

The separation of the animals into groups will take much less than one minute, so that there is sufficient capacity in this system of separation to supply a slaughter line running at a slaughtering speed of e.g. 720 pigs an hour. The gate 11 is raised and returned to its extreme right position in Figure 3.

In the meantime, three empty boxes 2o,2p,2q with grille walls, at least at the long walls, have been moved by means of a conveyor to the positions shown in Figure 3, each opposite its own section 40a,40b,40c. Elevating arrangements at the boxes will raise the three elevating gates 46 and the box walls 47 to a top position which allows the animals to pass from the sections 40a,40b,40c to the boxes 2o,2p,2q.

Powerful sources of light are placed over the boxes to encourage the willingness of the animals to enter the box.

The driving arrangement for the plates 45 will slowly move the plates over past the opposite side wall of the corridor, so that it is ensured that the animals will enter the boxes completely. When this has happened, the walls 47 of the boxes will be lowered again, and the plates 45 will again be pulled back to their initial positions. The gates 46 are lowered again, so that the corridor 40 is ready again to receive and separate a new flock of animals.

The boxes 2o,2p,2q are moved by means of a conveyor to the position indicated by 2r,2s,2t. From here they may be moved inidividually to the position 2u,2v,2w immediately in front of the stunning pit 3. The boxes are led one by one down into the pit, according to the need of the slaughter line for stunned animals, just like in the embodiments according to Figures 1 and 2.

When a box is down in the stunning pit, it will be conveyed through the pit and lifted up again after a predetermined stunning period, depending upon the stunning method (lethal or non-lethal) and the concentration of carbon dioxide of preferably 88-98%.

The stunned animals are discharged automatically on to a table 49, from where they may be chained for further treatment. The empty box is led through a washing station 49a and into one of the positions 2o,2p,2q as soon as there is room for it. In these positions three boxes may be filled again with animals which are to be stunned. The separation of animals into groups may take place independently of the supply or removal of boxes to/from the positions 2o,2p,2q.

The plant according to Figure 4 has boxes which are designed to hold 7-8 animals each. A flock of e.g. 15 animals from the pen area of the

slaughterhouse may be separated into two groups of 7 and 8 animals, respectively.

The animals are driven from the pens of the slaughterhouse through a corridor 12 by means of a travelling/elevating gate 13. It stops in position I. Two swing gates 57 in an adjacent corridor 5 are opened, as soon as two boxes have been placed into position 2x,2y by means of a conveyor 1, and the animals are driven forward in the corridor 5 by means of a travelling/elevating gate 11. The corridor is provided with a narrowing in the form of a sliding or elevating gate 50, which protrudes about 2/3 into the corridor. For pigs the opening is about 40-65 cm. The purpose of the narrowing is to regulate the flow of forward-moving animals, reducing the speed of the fastest animals, in order to keep the flock together. The corridor 5 opens into two rooms 51,52, of which the room 51 is half closed by means of a sliding gate 53, whereas the room 52 is completely closed by a sliding gate 54.

Placed over the room 51 is a video camera, which registers animal bodies in contrast to the floor. When 7 or 8 animals have been registered in the room 51, the sliding gate 53 will be actuated, so that the room is closed automatically. The gate 54 will be opened completely, so that the animals may enter the room 52. The gate 11 is waiting in position II until the gate 54 is completely opened, and then is moved forward to position III.

The sliding or elevating gate 50 slides away from the corridor 5 when the gate 11 passes by position II. The boxes 2x,2y, that are placed end to end with each of the rooms 51,52 comprise each an end wall closest to the rooms, said wall is designed as a sliding or an elevating gate. Two swing gates 58,59 in the rooms 51,52 are opened, and the gates of the boxes are slid aside by means of cylinders, allowing the animals to run forward and to move so from the room into the matching box. In the rooms 51,52 there are two travelling/elevating gates 55,56, which may be moved forward to the boxes 2x,2y automatically, so that the animals are driven all the way into the two boxes. When this has taken place, the end walls of the boxes, designed as elevating or sliding gates, are closed again.

When the gates 55, 56 by their movement towards the boxes have passed the corridor 5, the gate 11 may return to its initial position, and the sliding gate 50 and the intermediate gates 57 are returned to their initial positions, after which the corridor may be used again for a new flock of animals. The travelling/elevating gates 55,56, the swing gates 51, 52 and the sliding gates 53,54 are returned to their initial positions after the filling of the boxes has been completed.

The filled boxes may be transported to a waiting position 2z, from where first one and then the next may be led down into a stunning pit 3, according to the need for stunned animals, and then the treatment may take place in the same way as for the embodiments mentioned above, and when the boxes have been emptied and washed, they may be returned to positions 2x,2y via an overhead conveyor for re-use.

Claims

1. Apparatus for separating a flock of animals into groups, characterized in that the apparatus comprises an oblong corridor (5) which is wide enough to allow the animals to turn around in the corridor, and in that at least one transverse wall (7; 8; 9) protrudes from one side wall of the corridor so far into the corridor that two animals cannot pass through the gap between the transverse wall and the other side wall of the corridor at the same time, whereas one animal has free access through the gap.

2. Apparatus according to Claim 1, characterized in that means are provided to close the gap between the transverse wall (7; 8; 9) and the other side of the corridor.

3. Apparatus according to Claim 1 or Claim 2, characterized in that transverse walls (7; 8; 9) protrude alternately from one and from the other side wall of the corridor.

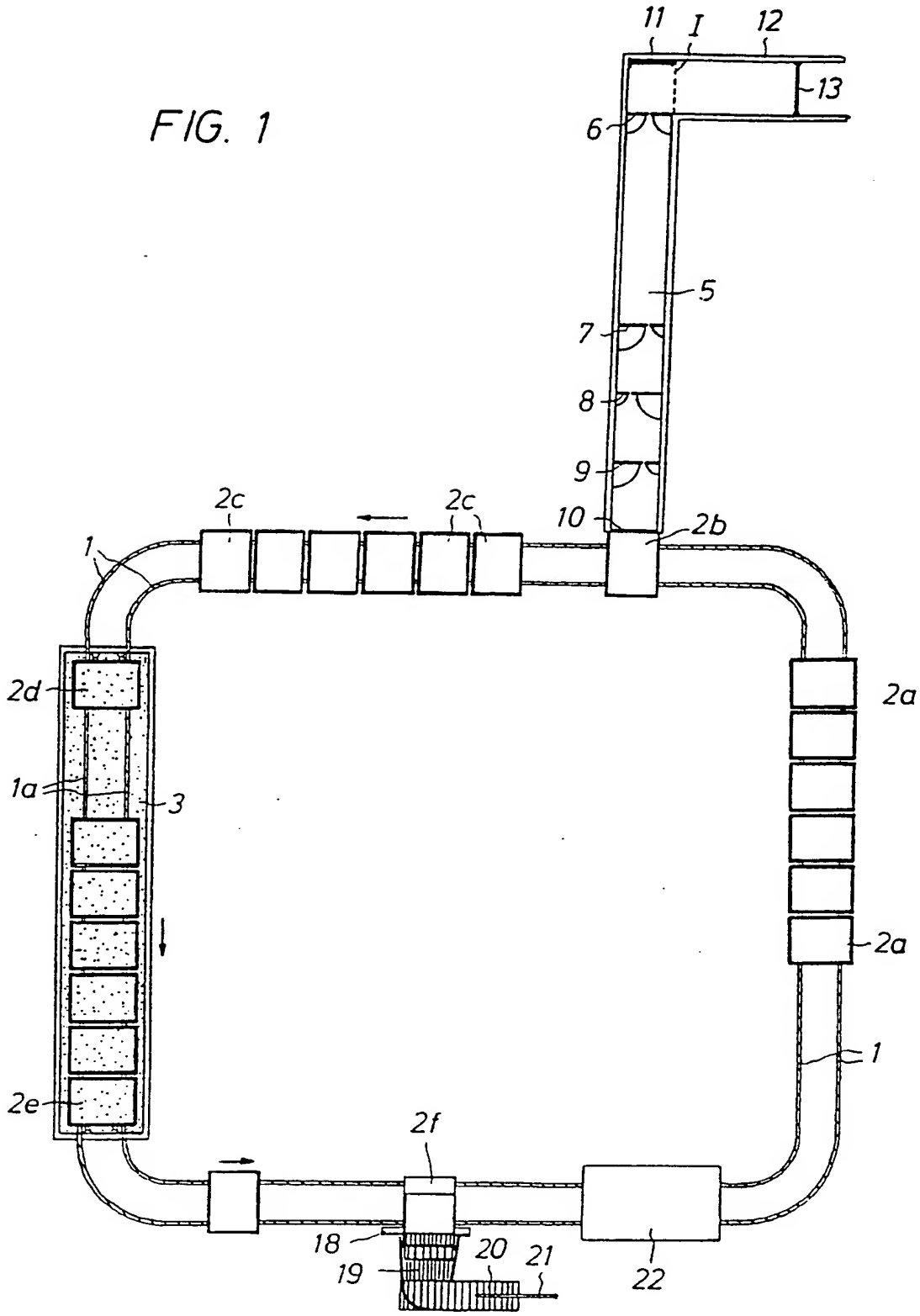
4. Apparatus according to any one of the preceding claims, characterized in that the floor area between two transverse walls (7; 8; 9) in the corridor is large enough to accommodate a group of 3-15, preferably 4-8, animals.

5. Apparatus according to any one of the preceding claims, characterized in that the transverse wall (7; 8; 9) is designed with or as sliding walls.

6. Apparatus according to any one of the preceding claims, characterized in that the transverse wall (7; 8; 9) is of a grille construction, and preferably comprises of vertical bars fastened in a frame.

7. Apparatus according to any one of the preceding claims, characterized in that the apparatus includes a registration unit which is designed to register the number of animals in at least one of the areas formed between two transverse walls (7; 8; 9), preferably by means of a vision system.

FIG. 1



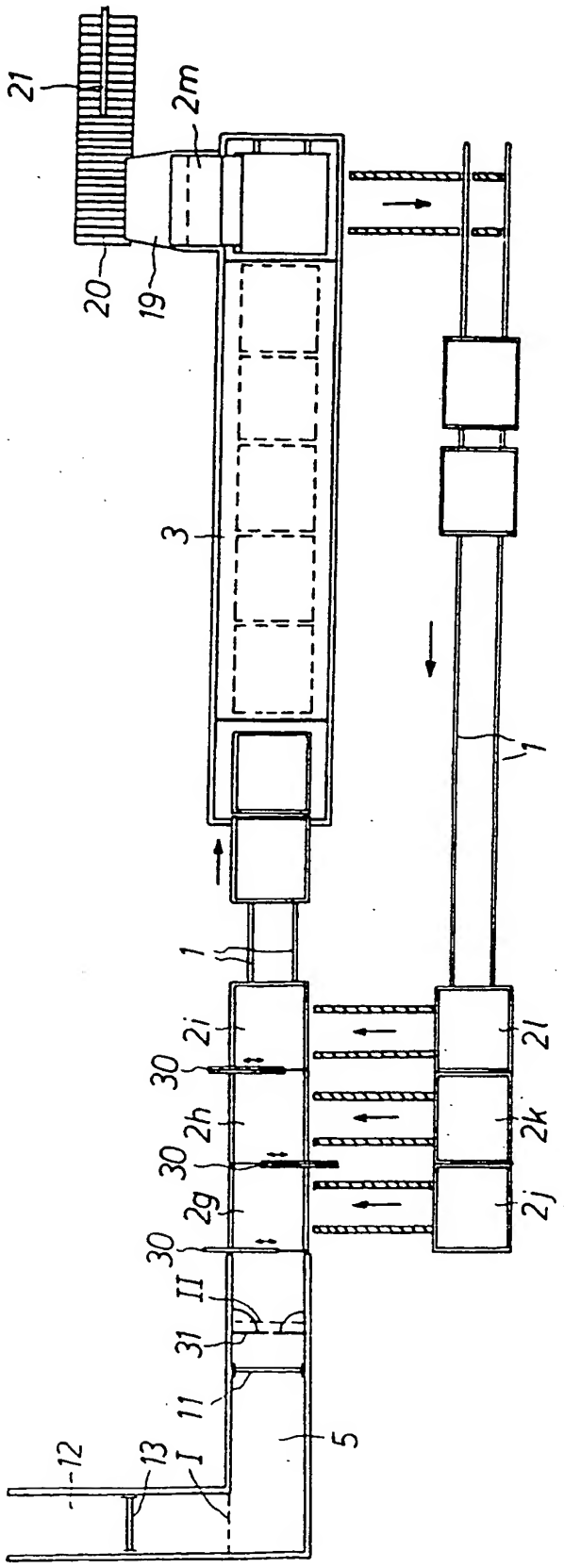


FIG. 2

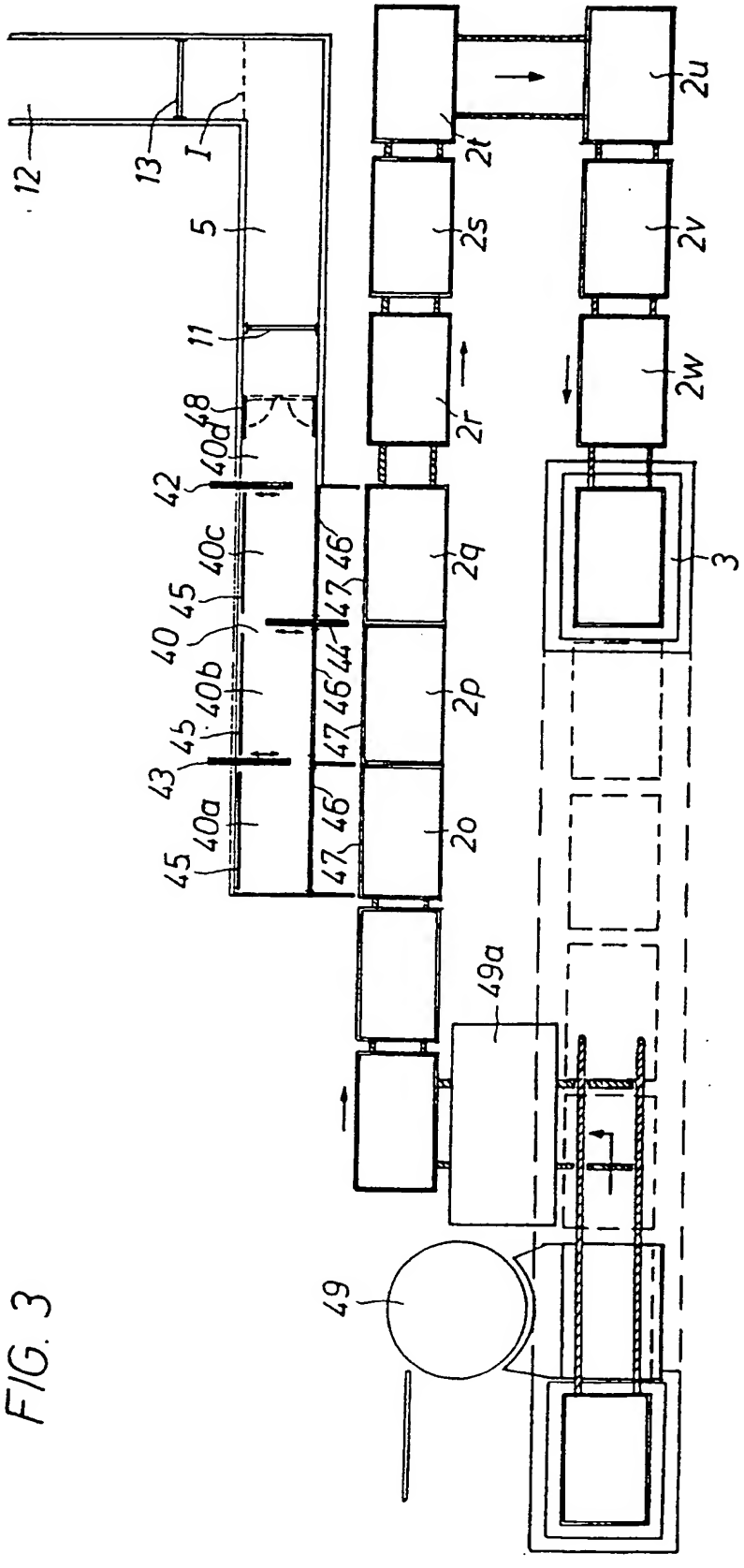

12
13
I
5
11
48
40d
42
40c
45
40
40b
45
43
40a
45
46
47
44
2o
2p
2q
2r
2s
2t
2u
2v
2w
3
49a
49

FIG. 3

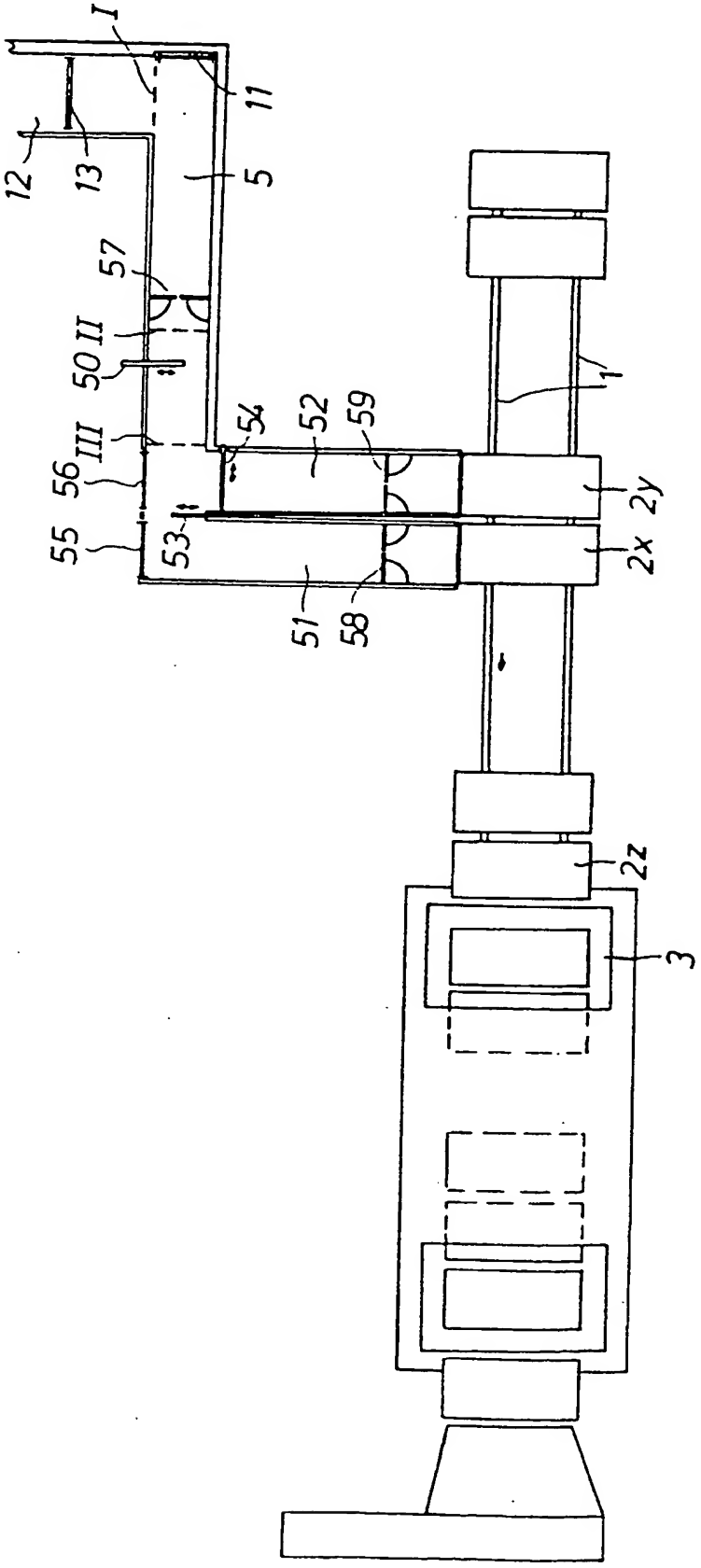


FIG. 4